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ABSTRACT

Six fourth- and fifth-grade classrooms of children were involved in three studies undertaken to measure the effectiveness of four sets of teaching behaviors on short-term student achievement gains. The following behaviors were considered: (1) sharing instructional objectives with students; (2) providing feedback emphasizing students' abilities; (3) conducting daily reviews for the purpose of relating the concepts and principles taught during the lesson; and (4) using formative quizzes to identify learning difficulties and follow up with appropriate corrective procedures. The research examined the effects of these procedures on the achievement of students in three subject areas: literature, social studies, and mathematics. Examination of the data and analysis of achievement scores in the various classes indicate that the use of instructional objectives, lesson reviews, ability praise, formative testing, and correctives are important instructional procedures and are related to student achievement. (JD)

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Teaching Effectiveness: Short Term Achievement Results

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RUNNING HEAD: Teaching Effectiveness

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Method

Subjects

The subjects of this research were children enrolled in regular fourth and fifth grade, public educational classrooms on Vancouver Island, British Columbia, Canada. The children were from urban, middle-income homes. Their intelligence range was estimated to be average to superior.

Six classrooms of children were involved in three studies. Each study was conducted in a separate school and involved two classrooms of children and two teachers.

Procedure

Subjects in each of three schools were randomly assigned to an experimental and control group. Both groups of children in each school were taught a unit of work by two teachers who worked together in planning the unit lessons. Co-operative planning was done to ensure that both groups of children in each study received the same information each day throughout the unit. While every attempt was made to ensure that the material and information presented to both groups of student during each study remained identical, the presentation of the lesson varied. When teaching the units to children in the experimental group the teachers in each study added the following procedures:

1. They shared the unit instructional objectives with the experimental students near the beginning of each lesson.
2. They used ability feedback frequently, e.g., "I know you

are a clever person that can solve this problem" or "You really are good at that".

3. They provided a daily review of important prerequisites from previous lessons. The review was also used to relate the concepts and principles taught during the lesson.

4. One formative quiz and one class period for corrective procedures were employed just prior to the summative test.

These four sets of teacher behaviours were not included in the lessons taught to students in the control group.

Summative, criterion-referenced achievement tests were administered at the mid-point and at the end of each unit. The mean scores from these two tests provided the data reported in this study. Following the administration of the first test the teachers exchanged classrooms. This was done to control for teacher variability.

Results

T-tests were used to identify the achievement differences between groups.

Study I: Literature Unit, Grade 5

There were no significant differences in the achievement scores between groups on achievement test 1 ($M = 35.42$ and 33.52), $t(18) = 1.27$, $p < .22$. There were significant differences between groups on test 2 ($M = 30.77$ and 25.61, $t(17) = 2.80$, $p < .01$.

Study II: Mathematics Unit, Grade 5

The achievement scores were significantly higher for students in the experimental groups on both achievement tests. For test 1 (M - 51.83 and 39.00, 5t(20.75 = 8.03, $p < .001$. For test 2 (M = 30.77 and 25.61), $t(17) = 2.80$, $p < .01$.

Study III: Social Studies Unit, Grade 4

The achievement scores were again significantly higher for students in the experimental groups of both achievement tests. For test 1 (M = 62.35 and 50.38), $t(30.14) = 4.75$, $p < .001$. For test 2 (M = 46.26 and 37.73), $t(36.00) = 3.13$, $p < .003$.

Discussion

The present study demonstrates that the use of instructional objectives, review, ability feedback, formative evaluation and correctives are specific procedures teachers can engage in to influence the performance of students as they proceed from lesson to lesson to complete typical units of work. The purpose of this study was to determine whether these combined procedures would influence student achievement when implemented into the teacher's daily lesson and unit planning. They appear to have accomplished this end in two of the three studies.

Instructional Objectives

Mager (1984) argues that instruction must be preceded by a clear statement about the results of a specific set of instructional procedures. In addition to the teacher having a clear understanding of the results of instruction, according to

Gagné (1985), so must the student. By sharing instructional objectives with students the teacher employs what Gagné calls incentive motivation. Incentives such as peer recognition, teacher praise, and the acquisition of knowledge become clearly linked to specific student performance.

The effects that instructional objectives have on learning, however, have not been clearly established. Several researchers report finding no significant difference in student achievement when instructional objectives were used (Aker, 1980; Kahle, 1978). Support for the use of instructional objectives was found by Anderson & Fowler (1978); Hartley & Davies (1976), and Boulanger (1981).

This study suggests that instructional objectives are but one important component of effective learning.

Lesson Reviews

A daily review is a teaching function that could be done more frequently in most classrooms (Rosenshine & Stevens, 1986). Good & Grouns (1979) found that the control teachers in their study held reviews only 50% of the time. Daily reviews, however, were reported as important procedures in the teaching programs designed by Good & Grounds (1979); Reid (1978), and Becker (1977).

The purpose of providing daily reviews in this study was to have students recall relevant information they had learned from previous lessons. Often this review included the reteaching of prerequisite skills. The idea of beginning lessons with a short review was to help students relate previously learned information

to the new information taught in the lesson. This procedure stems from Galloway's (1976) concept of a rich cognitive structure. According to Galloway, when students recognize the interrelationship that exists between concepts and principles, meaningful learning occurs and retention is enhanced.

Ability Feedback

Historically researchers have reported the benefits of providing students with feedback about their performance. More recently, researchers have examined the effects of specific types of feedback on academic achievement. Schunk (1983) and Schunk & Rice (1986), for example, found that ability feedback was more effective in promoting achievement and self-efficacy than either effort or no feedback. Ability feedback is one in which the student's ability is used to explain achievement results. Self-efficacy is one's judgment of his or her performance capabilities.

During this study ability feedback such as "you are good at that" and "you are a very clever group" were expressions of encouragment used by teachers with students in the experimental group.

Formative Evaluation and Correctives

"Formative testing is a single, highly effective tool that can profoundly affect both learning and the climate in which learning takes place," (Conner, Hairston, Hill, Kopple, Marshall, & Schulman, 1985, p. 63). According to these authors the teachers in the Philadelphia schools who use formative evaluation and

correctives as part of their teaching program reduce student failure rate (defined by a score of 70% on criterion-referenced tests) to 10 percent. Student achievement gains are reported by several other researchers when formative evaluation and corrective procedures are included in their teaching programs. Guskey & Pigott (1988), for example, conducted a meta-analysis of 46 studies in which formative evaluation and correctives were included in mastery learning programs. They conclude that these programs "yielded consistently positive effects on a broad range of student learning outcomes, including student achievements, retention of learning material, involvement in learning activities and student affects" (p. 146).

The purpose of formative evaluation is to identify and overcome students' learning difficulties. In the present study formative tests were administered near the end of each unit to identify students who experienced difficulties with particular unit objectives. Following the formative quizzes one class period was set aside to reteach the skill, idea or process students had not mastered.

In summary, it appears that the use of instructional objectives, lesson reviews, ability praise, formative testing and correctives are important instructional procedures and are related to student achievement. It may be, however, that some teachers will experience difficulty implementing these procedures into their lesson presentations. This could be one explanation for the lack of achievement differences between groups in Study I. As no

attempt was made to examine the extent to which these procedures were implemented during the study, this is difficult to determine. A second explanation might be the general nature of some questions asked on the summative tests. Several of the questions were not unit specific and might well have been answered from the students' general knowledge.

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